

### **Status of Claims**

- 1 (original). A method for treating an oropharyngeal disorder in a patient by neuromuscular electrical stimulation, said method comprising the steps of:
- (a) selectively placing a plurality of electrodes in electrical contact with tissue of a pharyngeal region of the patient;
  - (b) providing a pulse generator for generating a series of electrical pulses, each of which comprises a biphasic symmetrical waveform with an interval between the two phases;
  - (c) attaching the plurality of electrodes to the pulse generator so that the series of electrical pulses may be provided to the patient through the plurality of electrodes;
  - (d) generating a series of electrical pulses, each of which comprises a biphasic symmetrical waveform with an interval between the two phases;
  - (e) providing said series of electrical pulses to the patient through the plurality of electrodes.
- 2 (original). The method of claim 1 which includes generating a series of electrical pulses at a current of less than or equal to about 25 mA.
- 3 (original). The method of claim 1 which includes generating a series of electrical pulses at a frequency of about 80 Hz.

4 (original). The method of claim 1 which includes generating a series of electrical pulses at a voltage of less than or equal to about 100 V.

5 (original). The method of claim 1 which includes generating a series of electrical pulses at a power level of less than or equal to about 2500 mW.

6 (original). The method of claim 1 which includes the following steps instead of step (a) of claim 1:

- (a1) providing a first electrode and a second electrode, each of which comprises:
  - (i) a snap eyelet having a first side and a second side, said second side having a connector to which a lead wire may be attached;
  - (ii) a conductive film that is attached to the first side of the snap eyelet;
  - (iii) an adhesive and conductive gel layer that is attached to the conductive film and adapted to be attached to the skin of the patient;
- (a2) providing at least one adhesively backed tape overlay for securing the first and second electrodes to the skin of the patient;
- (a3) placing the first electrode on the skin of the patient's pharyngeal region with the adhesive gel layer in contact with the skin;
- (a4) placing the second electrode on the skin of the patient's pharyngeal region with the adhesive gel layer in contact with the skin;
- (a5) securing the electrodes to the skin of the patient's pharyngeal region by application of at least one adhesively backed tape overlay to the skin of the patient's pharyngeal region over at least a portion of each of the electrodes.

7 (original). The method of claim 1 which includes generating a series of electrical pulses, each of which comprises a biphasic symmetrical rectangular waveform having a total pulse duration of about 550 to about 850 microseconds, which pulse duration includes an interphase interval of about 50 to about 150 microseconds.

8 (original). The method of claim 1 which includes generating a series of electrical pulses, each of which comprises a biphasic symmetrical rectangular waveform having a total pulse duration of about 700 microseconds, which pulse duration includes a first phase of about 300 microseconds, an interphase interval of about 100 microseconds and a second phase of about 300 microseconds.

9 (original). A method for treating an oropharyngeal disorder in a patient by neuromuscular electrical stimulation, said method comprising the steps of:

- (a) selectively placing a first pair of electrodes in electrical contact with tissue of a pharyngeal region of a patient;
- (b) selectively placing a second pair of electrodes in electrical contact with tissue of a pharyngeal region of a patient;
- (c) providing an apparatus for generating a series of electrical pulses for application of neuromuscular electrical stimulation to the patient through said first pair of electrodes, and for generating a series of electrical pulses for application of neuromuscular electrical stimulation to the patient through said second pair of electrodes, said apparatus comprising:

- (i) a first pulse generator for generating a first series of electrical pulses, each of which comprises a biphasic symmetrical waveform with an interval between the two phases, for output through a first channel;
- (ii) a first output jack for electrically connecting the first pair of electrodes to the first channel;
- (iii) a first intensity control circuit for regulating the first series of electrical pulses for output through the first channel such that the electrical current does not exceed a first predetermined value;
- (iv) a first frequency controller for controlling the frequency at which the series of electrical pulses is generated by the first pulse generator for output through the first channel so that such pulses are generated at a first predetermined frequency;
- (v) a first duration control circuit for controlling the duration of each electrical pulse generated by the first pulse generator;
- (vi) a second pulse generator for generating a second series of electrical pulses, each of which comprises a biphasic symmetrical waveform with an interval between the two phases, for output through a second channel;
- (vii) a second output jack for electrically connecting the second pair of electrodes to the second channel;
- (viii) a second intensity control circuit for regulating the second series of electrical pulses for output through the second channel such that the electrical current does not exceed a second predetermined value;
- (ix) a second frequency controller for controlling the frequency at which the

series of electrical pulses is generated by the second pulse generator for output through the second channel so that such pulses are generated at a second predetermined frequency;

- (x) a second duration control circuit for controlling the duration of each electrical pulse generated by the second pulse generator;
- (d) connecting the first pair of electrodes to the first output jack;
- (e) connecting the second pair of electrodes to the second output jack;
- (f) generating a first series of electrical pulses, each of which comprises a biphasic symmetrical waveform with an interval between the two phases, for output through the first channel;
- (g) generating a second series of electrical pulses, each of which comprises a biphasic symmetrical waveform with an interval between the two phases, for output through the second channel;
- (h) providing the first series of electrical pulses through the first channel to the first pair of electrodes;
- (i) providing the second series of electrical pulses through the second channel to the second pair of electrodes.

10 (original). An apparatus for generating a series of electrical pulses for application of neuromuscular electrical stimulation to a patient through a plurality of electrodes for treatment of oropharyngeal disorders, said apparatus comprising a pulse generator which generates a series of electrical pulses, each of which pulses comprises a biphasic symmetrical waveform with an interval between the two phases, said pulse generator further comprising:

- (a) an intensity control circuit for regulating the series of electrical pulses such that the intensity of the electrical pulses does not exceed a predetermined value;
- (b) a frequency controller for controlling the frequency at which the series of electrical pulses is generated so that such pulses are generated at a predetermined frequency;
- (c) a duration control circuit for controlling the duration of each such electrical pulse.

11 (original). The apparatus of claim 10 wherein the intensity control circuit allows the predetermined value for the intensity of the series of electrical pulses to be selectively set at a current level within the range of 0.5-25 mA.

12 (original). The apparatus of claim 10 wherein the frequency controller controls the frequency at which the series of electrical pulses is generated so that such pulses are generated at a frequency of about 80 Hz.

13 (original). The apparatus of claim 10 which includes:

- (a) a first electrode and a second electrode, each of which comprises:
  - (i) a snap eyelet having a first side and a second side, said second side having a connector to which a lead wire may be attached;
  - (ii) a conductive film that is attached to the first side of the snap eyelet;
  - (iii) an adhesive and conductive gel layer that is attached to the conductive film and adapted to be attached to the skin of the patient;
- (b) at least one adhesively backed tape overlay for securing the first and second electrodes to the skin of the patient.

14 (original). The apparatus of claim 10 which comprises a pulse generator which generates a series of electrical pulses, each of which comprises a biphasic symmetrical rectangular waveform, said pulse generator having a duration control circuit for controlling the duration of each such electrical pulse so that each such pulse has a total pulse duration of about 550 to about 850 microseconds, which pulse duration includes an interphase interval of about 50 to about 150 microseconds.

15 (original). The apparatus of claim 14 wherein the duration control circuit controls the duration of each such electrical pulse so that each such pulse has a total pulse duration of about 700 microseconds, which pulse duration includes a first phase of about 300 microseconds, an interphase interval of about 100 microseconds and a second phase of about 300 microseconds.

16 (original). An apparatus for generating a series of electrical pulses for application of neuromuscular electrical stimulation to a patient for treatment of oropharyngeal disorders, said apparatus comprising:

- (a) a first pair of electrodes;
- (b) a second pair of electrodes;
- (c) a first pulse generator for generating a first series of electrical pulses, each of which comprises a biphasic symmetrical waveform with an interval between the two phases, for output through a first channel;
- (d) a first intensity control circuit for regulating the first series of electrical pulses for output through the first channel such that the electrical current does not exceed a first predetermined value;
- (e) a first frequency controller for controlling the frequency at which the first series of electrical pulses is generated by the first pulse generator for output through the first channel so that such pulses are generated at a predetermined frequency;
- (f) a first duration control circuit for controlling the duration of each electrical pulse generated by the first pulse generator;
- (g) a second pulse generator for generating a second series of electrical pulses, each of which comprises a biphasic symmetrical waveform with an interval between the two phases, for output through a second channel;
- (h) a second intensity control circuit for regulating the second series of electrical pulses for output through the second channel such that the electrical current does not exceed a second predetermined value;



- (i) a second intensity control circuit for regulating the second series of electrical pulses for output through the second channel such that the electrical current does not exceed a second predetermined value;
- (j) a second frequency controller for controlling the frequency at which the second series of electrical pulses is generated by the pulse generator for output through the second channel so that such pulses are generated at a predetermined frequency;
- (k) a second duration control circuit for controlling the duration of each electrical pulse generated by the second pulse generator.

17 (original). The apparatus of claim 16 wherein:

- (a) the predetermined value for the electrical current of the first series of electrical pulses may be selectively set at a current level within the range of 0.5-25 mA; and
- (b) the predetermined value for the electrical current of the second series of electrical pulses may be selectively set at a current level within the range of 0.5-25 mA.

18 (original). The apparatus of claim 16 wherein the frequency controller for each pulse generator controls the frequency at which the series of electrical pulses is generated for output through each channel so that such pulses are generated at a frequency of about 80 Hz.

19 (original). The apparatus of claim 16 wherein the duration control circuit for each pulse generator controls the duration of each such electrical pulse so that each such pulse has a total pulse duration of about 550 to about 850 microseconds, which pulse duration includes an interphase interval of about 50 to about 150 microseconds.

20 (original). The apparatus of claim 16 which includes:

- (a) a first pair of electrodes, each of which comprises:
  - (i) a snap eyelet having a first side and a second side, said second side having a connector to which a lead wire may be attached;
  - (ii) a conductive film that is attached to the first side of the snap eyelet;
  - (iii) an adhesive and conductive gel layer that is attached to the conductive film and adapted to be attached to the skin of the patient;
- (b) a second pair of electrodes, each of which comprises:
  - (i) a snap eyelet having a first side and a second side, said second side having a connector to which a lead wire may be attached;
  - (ii) a conductive film that is attached to the first side of the snap eyelet;
  - (iii) an adhesive and conductive gel layer that is attached to the conductive film and adapted to be attached to the skin of the patient;
- (c) at least one adhesively backed tape overlay for securing at least one pair of electrodes to the skin of the patient.